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European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25715

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E21B 23/00

US CL : 166/207,384

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 166/207,384,206,380

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,325,148 A (Trahan et al.) 4 December 2001 (04.12.2001), Fig. 9 and col. 6, lines 10-35.	1-3,6,9,13-15,17,20
X,P	US 6,457,532 A (Simpson) 1 October 2002 (01.10.2002), Figs. 20, 22 24, and col. 12, line 27- col. 14, line 9.	1-7,13-17,19

Y,P		8,10-12,18,21-22
X	US 1,597,212 A (Spengler) 24 August 1926, (24.08.1926), Entire document, particularly Figure 1.	1-5,13-16

Y		8,18
Y,P	US Patent Application Publication 2003/0075338 (Sivley), 24 April 2003 (24.04.2003), Fig. 10 and paragraph 0118 on pages 9-10.	10-12,21,22
X	US 3,039,530 A (Condra) 19 June 1962 (19.06.1962), Fig. 1, col. 1, lines 7-12.	1-3,6,9



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

04 March 2004 (04.03.2004)

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